Volunteer Lake Assessment Program Individual Lake Reports

SUNSET LAKE, ALTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	3,598	**Max. Depth (m):**	23.7	**Flushing Rate (yr^{-1}):**	1.7
Surface Area (Ac.):	205	**Mean Depth (m):**	5.6	**P Retention Coef:**	0.55
Shore Length (m):	5,600	**Volume (m^3):**	4,651,000	**Elevation (ft):**	808

TROPHIC CLASSIFICATION

Year	Trophic class
2000	OLIGOTROPHIC
2008	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

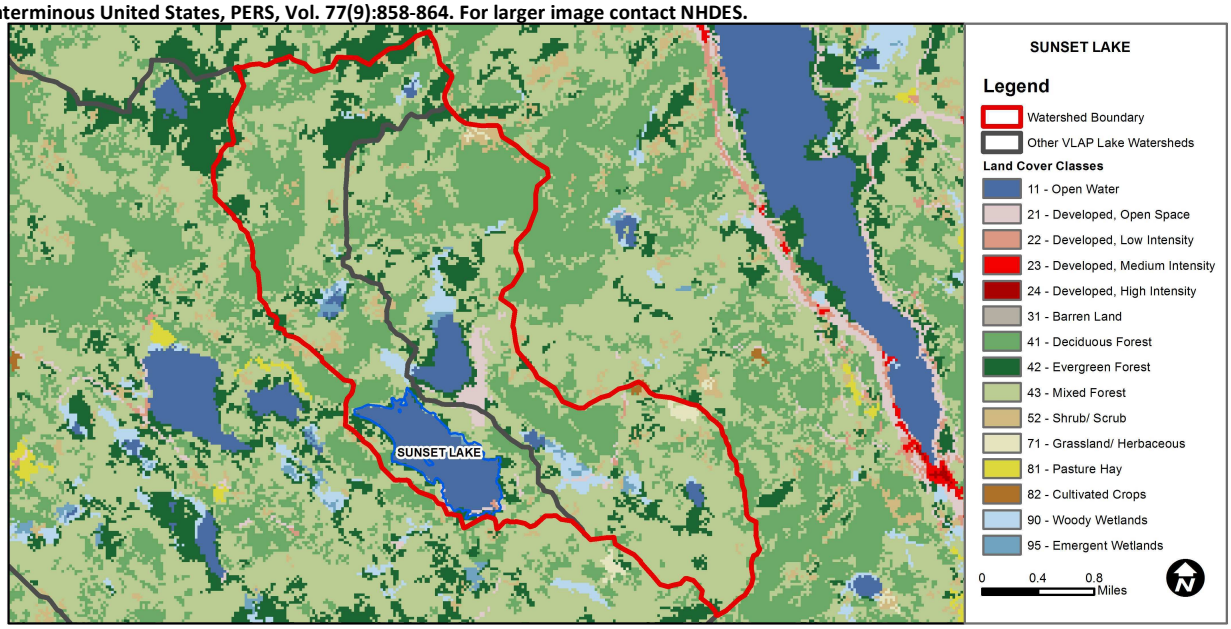
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

SUNSET LAKE HIDDEN VALLEY BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	7.75	Barren Land	0	Grassland/Herbaceous	0.44
Developed-Open Space	1.65	Deciduous Forest	29.3	Pasture Hay	0
Developed-Low Intensity	0.09	Evergreen Forest	10.93	Cultivated Crops	0.07
Developed-Medium Intensity	0	Mixed Forest	44.02	Woody Wetlands	2.57
Developed-High Intensity	0	Shrub-Scrub	2.48	Emergent Wetlands	0.72

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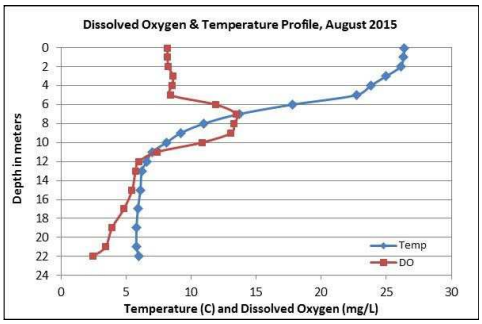
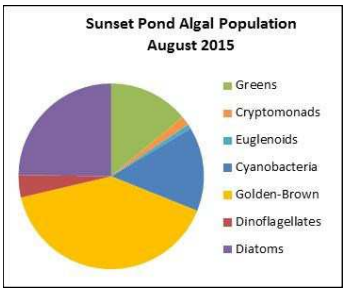
2015 Data Summary

Recommended Actions: Water quality in 2015 was good and water quality data are generally representative of Oligotrophic or high quality conditions. The dry weather conditions may have helped to improve water quality and transparency in 2015. This highlights the importance of managing stormwater runoff in the watershed. The increased frequency and intensity of storm events can carry phosphorus and sediment laden water to the tributaries and lake. Educate lake front property owners on maintaining vegetated buffers and utilize DES' "NH Homeowner's Guide to Stormwater Management" to install stormwater controls. Keep up the great work!

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were low in August and much less than the state median. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began. We hope to see this continue!
- **Conductivity/Chloride:** Deep spot, Inlet and Outlet conductivity levels remained low and much less than the state median. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity since monitoring began.
- **E. coli:** Beach 4, Inlet and Outlet E. coli levels were much less than the state standards for public beaches (88 cts/100 mL) and surface waters (406 cts/100 mL).
- **Total Phosphorus:** Deep spot, Inlet and Outlet phosphorus levels remained low, decreased slightly from 2014 and were much less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with high variability between years.
- **Transparency:** Transparency was slightly lower than average in May but increased (improved) greatly in August. Average transparency improved from 2014 and was much better than the state median. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Transparency measured with the viewscope (VS) was generally much higher (better) than that measured without (NVS) and likely a better representation of actual conditions.
- **Turbidity:** Deep spot, Inlet and Outlet turbidities were low on each sampling event.
- **pH:** Epilimnetic, metalimnetic (middle water layer), Inlet, and Outlet pH levels were within the desirable range 6.5-8.0 units, however have fluctuated below the desirable range historically. Hypolimnetic (lower water layer) pH was less than desirable. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began.
- **Dissolved Oxygen/Temp:** Dissolved oxygen levels were generally good throughout the water column in August. Dissolved oxygen levels spiked in the metalimnion between 6 and 10 meters and this typically indicates a layer of algae at those depths as algae release oxygen as a product of photosynthesis.





Station Name	Table 1. 2015 Average Water Quality Data for SUNSET LAKE								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	5.5	2.20	25.0		3	6.25	7.44	0.54	6.52
Metalimnion			23.2		9			0.76	6.51
Hypolimnion			24.8		8			0.71	5.96
Beach 4				22					
Inlet			26.5	10	5			0.51	6.59
Outlet			26.5	10	5			0.50	6.81

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Improving	Data significantly decreasing.
pH (epilimnion)	Worsening	Data significantly decreasing.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.